What is claimed is:

~~Patent Claims~~

1. Silicon germanium hetero bipolar transistor suitable for high frequency applications, with a silicon collector layer, a doped silicon germanium base layer and a silicon emitter layer, characterized by the fact that carbon is incorporated in at least one of the three individual layers, i.e. the emitter layer and/or the base layer and/or the collector layer, in a concentration between 10^{18} cm^{-3} and 10^{21} cm^{-3} and that the relative change in the lattice constant thus introduced is less than $5 \cdot 10^{-3}$ so that a point defect supported diffusion acceleration is prevented.

2. Silicon germanium hetero bipolar transistor suitable for high frequency applications according to claim 1, characterized by the fact that the base layer is doped with boron and with a concentration of the dopant in the base region between $5 \cdot 10^{19}$ cm^{-3} and 10^{-3} cm^{-3} the concentration of carbon in the epitaxy layer is between 10^{18} cm^{-3} and 10^{21} cm^{-3} and the defect density of the transistor is less than 10^{4} cm^{-2}.

3. Silicon germanium hetero bipolar transistor suitable for high frequency applications according to claim ~~1 or~~ 2, characterized by the fact that the width of the base from the collector to the emitter is between 5 nm and 40 nm

4. Silicon germanium hetero bipolar transistor suitable for high frequency applications according to claim 1 ~~one or more of the preceding claims,~~ characterized by the fact that the concentration of germanium in the base layer is between 8% and 30% and preferably between 20% and 28%.

5. Silicon germanium hetero bipolar transistor suitable for high frequency applications according to one or more of the preceding claims,

characterized by the fact that the shape of the germanium concentration curve corresponds to a rectangle, a triangle or a trapezoid.

6. Method of fabricating the epitaxial individual layers of a silicon germanium hetero bipolar transistor suitable for high frequency applications characterized in claim 1 with a silicon collector layer, a doped silicon germanium base layer and a silicon emitter layer, characterized by the fact that during fabrication of individual layers, i.e. the emitter layer (4), base layer (3) and collector layer (2) carbon is added to at least one of these layers in a concentration between 10^{18} cm^{-3} and 10^{21} cm^{-3} so that a point defect supported diffusion acceleration is prevented, and that the base layer is simultaneously doped with doping atoms with the relative change in the lattice constant thus introduced being less than $5 \cdot 10^{-3}$.

7. Method of claim 6, characterized by the fact that during one process step (A), namely vapor deposition of silicon for fabricating the collector layer, carbon is incorporated in a concentration between 10^{18} cm^{-3} and 10^{21} cm-3

8. Method of claim 6, characterized by the fact that during one process step (B), namely vapor deposition of silicon and additional incorporation of germanium and dopant for fabricating the base layer, carbon is incorporated in a concentration between 10^{18} cm^{-3} and 10^{21} cm^{-3}.

9. Method of claim 6, characterized by the fact that during one process step (C), namely discontinuing germanium and dopant and vapor deposition of silicon for fabricating the emitter layer, carbon is incorporated in a concentration between 10^{18} cm^{-3} and 10^{21} cm^{-3}, the

relative change in the lattice constant thus introduced being less than $5 \cdot 10^{-3}$.

10. Method according to ~~one of claims 7 to~~ 9, characterized by the fact that during process steps (A) and (B) or process steps (A) and © or process steps (B) and © carbon is incorporated in a concentration between 10^{18} cm^{-3} and 10^{21} cm^{-3}.

11. Method according to ~~one or more of the claims 7 to~~ 10, characterized by the fact that during fabrication of the base layer (3) boron is used as the dopant in a concentration between $5 \cdot 10^{18}$ cm^{-3} and 10^{21} cm^{-3}.

12. Method according to ~~one or more of the claims 7 to~~ 11, characterized by the fact that fabrication of the epitaxial layer is performed by a CVD process.

13. Method according to ~~one or more of the claims 7 to~~ 11, characterized by the fact that fabrication of the epitaxial layer is performed by a MBE process.